MODULE SPECIFICATION

Part 1: Information			
Module Title	Advanced Control Engineering		
Module Code	UFMFUL-15-M	Level	Level 7
For implementation from	2018-19		
UWE Credit Rating	15	ECTS Credit Rating	7.5
Faculty	Faculty of Environment & Technology	Field	Engineering, Design and Mathematics
Department	FET Dept of Engin Design & Mathematics		
Contributes towards			
Module type:	Standard		
Pre-requisites	Control Engineering 2018-19		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description

Educational Aims: See Learning Outcomes

Outline Syllabus: Introduction of discrete time methods of description, difference equations and the z transform.

State variable based control strategies and controller layout and strategy.

Coping with non-linearities – piecewise linearization, Lyapunov etc.

Design of multivariable state feedback controllers, decoupled systems, observers.

Introduction to alternative algorithms – for example fuzzy controllers, neural networks etc.

The use of software packages to analyse and design control systems (for example Matlab, Simulink).

Teaching and Learning Methods: Large group teaching session supported by small group tutorial sessions to ensure that students have a sound grasp of fundamental concepts. Students will be expected to cover new material and practice example problems and exercises as part of their independent study.

Scheduled learning includes teaching sessions and tutorials.

Independent learning includes hours engaged with essential reading and assessment preparation. These sessions constitute an average time per level as indicated in the table below. Scheduled sessions may vary slightly depending on the module choices you make.

Part 3: Assessment

Component A

To reflect the requirements of a professional in industry, the assessment will be in the form of an examination, with questions based on actual problem solving techniques used in industry.

This would include providing such data as appropriate, to allow the assessment of decision making processes and design expertise rather than generating a test of memory of facts.

Support for this type of work would be provided by the use of example case study material in the tutorial sessions and problem based learning sessions to develop a suitable level of skill.

First Sit Components	**Final Assessment**	**Element weighting**	**Description**
Examination - Component A	✓	100 %	Examination
Resit Components	**Final Assessment**	**Element weighting**	**Description**
Examination - Component A	✓	100 %	Examination

Part 4: Teaching and Learning Methods

Learning Outcomes

On successful completion of this module students will be able to:

	Module Learning Outcomes
MO1	Show an advanced professional level of knowledge and understanding of critical analysis techniques for advanced control systems.
MO2	Demonstrate subject specific knowledge in the development of appropriate control strategies for real systems.
MO3	Analyse and compare techniques for the design of control systems suitable for real world problems.
MO4	Demonstrate techniques in the simulation of control systems using industry standard software packages.
MO5	Recognise and analyse difficulties associated with system control such as non-linearity and the discretisation of time and use techniques to minimise the impact of such difficulties.

Contact Hours

Contact Hours	
Independent Study Hours:	
Independent study/self-guided study	114
Total Independent Study Hours:	114
Scheduled Learning and Teaching Hours:	
Face-to-face learning	36
Total Scheduled Learning and Teaching Hours:	36
Hours to be allocated	150
Allocated Hours	150

Reading List

The reading list for this module can be accessed via the following link:

https://uwe.rl.talis.com/modules/ufmful-15-m.html